

REMARKS

Rejections Based on Candy, U.S. Patent No. 4,942,360

Claims 1 - 7 stand rejected under 35 USC §102(b) as being anticipated by Candy, U.S. Patent No. 4,942,360 ("Candy"). The examiner states that Candy discloses resolving response signals into respective portions that are at least primarily resistive, comparing the magnitudes of at least two of the portions (citing Col. 1, lines 27 - 30) and "selecting one response signal from among said response signals based on the results" (citing Col. 8, line 68 - Col. 9, line 3). Applicant respectfully traverses the rejections.

Candy's method and apparatus is shown in its Figure IV, and described at Col. 8, line 41 to Col. 9, line 3. Two sets of three synchronous demodulators are provided for synchronously demodulating a corresponding three response signals at a respective three different frequencies (W1, W2, and W3). Particularly, demodulators 48 - 50 demodulate the three response signals' reactive components (Col. 8, line 55) while demodulators 51 - 53 demodulate the three response signals' resistive components (Col. 8, lines 57 - 58). The demodulator outputs for the reactive components of the three different response signals are all combined (at 56), and the demodulator outputs for the resistive components of the three different response signals are all combined (at 57). A selector 62 is used to select between one of (a) the combined reactive components and (b) the combined resistive components, depending on which has the highest instantaneous output (Col. 8, line 68 - Col. 9, line 3).

Claim 1 recites response signals for at least two different frequencies. The response signals are resolved into respective portions that are at least primarily resistive (for purposes of discussion,

referred to herein as “resistive portions”). The magnitudes of the resistive portions are compared with each other, and the results of the comparison are used to choose one of the response signals for use in characterizing the target.

In Candy, the magnitudes of the respective resistive components are not compared with each other as claimed. Rather, the resistive components in Candy are all combined together before any comparison is made.

Further, the comparison disclosed in Candy compares a combination of resistive components with a combination of reactive components. This is not even close to the method claimed wherein resistive components are compared with resistive components.

Still further, Candy selects one or the other combinations of the resistive or reactive components of response signals, and this is not even close to the method claimed wherein a selection is made between the response signals themselves.

It should also be noted that Candy discloses no reason for making its disclosed selection and discloses no use thereof, so that it cannot even be said that Candy discloses Applicant’s step of characterizing a target by use of the thing that is being selected.

In fact, the only pertinence of Candy to the present invention is what is disclosed about Candy in the Background portion of Applicant’s specification at Page 4, lines 1 - 5, i.e., that Candy proposes ground balancing by forming various linear combinations of X and Y components.

It is respectfully submitted that for the foregoing reasons the rejections of claims 2 - 7 for alleged anticipation by Candy as well as the rejections of claims 8 - 11 for alleged unpatentability over Candy in view of Tornblom, U.S. Patent No. 4,237,419 are moot. Accordingly, further argument in response to those rejections is omitted.

Rejections Based on Shoemaker, U.S. Patent No. 5,642,050

Claims 12 - 13 stand rejected under 35 USC §102(b) as being anticipated by Shoemaker, U.S. Patent No. 5,642,050 (“Shoemaker”). The examiner states that Shoemaker discloses identifying in a response signal a selected signal characteristic (at Col.3, lines 7 - 11), normalizing the identified signal characteristic with respect to reference data (at Col. 8, line 1 - Col. 9, line 20, and Col. 10, lines 64 - 66), and comparing the normalized signal characteristic with the signal characteristics of the reference data to identify a metal target (at Col. 10, line 66 - Col. 11, line 12). Applicant respectfully traverses the rejections.

It is believed that claims 12 and 13 were not entirely clear, and both claims have been amended to clarify them.

In the cited portions of Shoemaker, the reference describes a “ground subtraction system”, wherein X and Y components of a response signal are processed as follows:

$$X' = K_{o1}(X + K_1Y)$$

$$Y' = K_{o1}(Y - K_1X)$$

$$X'' = K_{o2}(X + K_2Y)$$

$Y'' = K_{o2}(Y - K_2X)$, where the K's are “parameters” or “constants” (Col. 8, lines 25 - 61).

It is apparent that each variable in the combination is scaled by a scale factor and, to that extent, is “normalized” as the examiner asserts. Particularly, the X variables are normalized with respect to the parameters K_{o1} and K_{o2} , and the Y variables are normalized with respect to the products $(K_{o1} \cdot K_1)$ and $(K_{o2} \cdot K_2)$, where $K_1 = (G_{Y1}/G_{X1})$, $K_2 = (G_{Y2}/G_{X2})$, $K_{o1} = 1$, and $K_{o2} = (G_{X1})^2$

+ $G_{Y1}^2 / G_{X2}^2 + G_{Y2}^2$), where the G's are components of the received signal due to the background at the two frequencies (Col. 8, lines 6 - 8 and 30 - 45). Therefore, assuming that the X and Y variables are being alleged to be "signal characteristics" as claimed, the following would all be "normalized signal characteristics" according to the allegation:

$$K_{\sigma 1} X$$

$$K_{\sigma 1} \cdot K_1 Y$$

$$K_{\sigma 1} Y$$

$$-K_{\sigma 1} \cdot K_1 X$$

$$K_{\sigma 2} X$$

$$K_{\sigma 2} \cdot K_2 Y$$

$$K_{\sigma 2} Y$$

$$-K_{\sigma 2} \cdot K_2 X$$

Continuing to assume the premise of the allegation¹, one of these normalized values must be identified as a normalized signal characteristic for which the reference data have a corresponding selected signal characteristic according to the rejected claims. For example, if it is being asserted that $K_{\sigma 1} Y$ is a normalized signal characteristic according to the claims, there must be reference data having a signal characteristic corresponding to $K_{\sigma 1} Y$, for comparison, e.g., there must be reference data Y' , where $K_{\sigma 1} Y$ is compared with the Y' . Moreover, the reference data Y' must relate the Y' to a plurality of metal targets so that the target producing the response signal component Y can be identified as a result of the comparison.

At this point, it is respectfully submitted that the Examiner should clarify the rejections in

¹ The premise of the allegation is being assumed for purposes of argument only.

a non-final Office Action if the rejections are to be maintained. This is because it is not clear at all what in Shoemaker is being alleged to be identified as the Y' in the example above. The G components seem the most likely candidates, but Shoemaker does not disclose that there are G reference data for a plurality of metal targets, nor does Shoemaker disclose comparing $K_{\sigma 1}$ Y with any of G_{X1} , G_{X2} , G_{Y1} , or G_{Y2} to identify a metal target, or for any other purpose.

Alternatively, it is respectfully submitted that claims 1 - 13 patentably distinguish over the references of record, and the Examiner is respectfully requested to allow claims 1 - 13 and pass this case to issue.

Sincerely,

A handwritten signature in black ink, appearing to read 'Garth Janke', written over the printed name.

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